Interactive exhibit

Abiotic stress response of durum wheat near isogenic lines

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Accurate phenotyping is essential to establish the most adequate target trait for selecting grain yield under stress condition. To realise these phenomena we used a rain-out shelter experimental place of the Agricultural Institute at Martonvásár. The effect of drought on the physiological parameters and yield components was examined for eight near isogenic lines (NILs) originated form the crosses of Kofa x Svevo durum wheats. An additional aim was to reveal relationship between the degree of drought tolerance and protective compounds.
In the case of dry condition there was significant correlation between the chlorophyll content of flag leaf and grain weight of the main spike (r=0.68*) at booting stage (ZDS45), while at dough stage (ZDS85) it has a significant correlation with number of tillers (r=0.64*) and the grain weight of tillers (r=0.62*). The higher chlorophyll content of NIL1++ and NIL 3++ lines indicated the longer photosynthetic activity of these lines, resulted higher seed number and seed weight.
The poliamine contents of the leaves, especially of free forms of putrescine and spermidine were higher in all the drought stressed lines compared to the irrigated ones. The activity of antioxidant enzymes showed different changes, the ascorbate peroxidase activity was similar or lower, while that of guaiacol peroxidase was higher in the leaves of plants grown under drought conditions.
In conclusion, considerable variation was detected among the eight NILs in their response to drought stress measured via phenology and yield component traits. The stress tolerance of the NIL1++ and NIL3++ isogenic lines were better than the experimental average therefore the yield components of these lines were over the other studied NIL lines. Although close correlation exists between the putrescine content and guaiacol peroxidase activity, relationship between the amount and the activity of these protective compounds and the level of drought tolerance could not be detected.

Keywords: drought stress, durum wheat near isogenic lines, yield components, protective compounds

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